

Module:2	SOFTWARE REQUIREMENT ANALYSIS	5 hours
Requirements Engineering-Establishing the Groundwork-Eliciting Requirements- Developing use cases-Building the requirements model-Negotiating, validating Requirements-Requirements Analysis-Requirements Modeling Strategies.		
Specifying Requirements: functional and non-functional requirements; specification exercise. Managing the Requirements Process: methods which provide a structure for co-operation between different stake holders. Prototyping: The role of prototyping in requirements techniques for prototyping. Requirements for Future Technologies: Computer Supported Co-operative Work (CSCW); networked multi-media systems.		
Module:3	SOFTWARE DESIGN	5 hours
Design concepts and principles - Abstraction - Refinement - Modularity – Cohesion & coupling, Architectural design, Detailed Design – Transaction & Transformation, Refactoring of designs, Object-oriented Design User-Interface Design; Object Oriented Design Concepts and Diagrams - Use Case Diagrams - Class Diagrams - Interaction Diagrams - State chart Diagrams - Activity Diagrams - Package Diagrams - Component Diagrams – Deployment Diagrams		
Module:4	SOFTWARE IMPLEMENTATION	4 hours
Structured coding Techniques-Coding Styles-Standards and Guidelines- Documentation Guidelines-Modern Programming Language Features: Type checking-User defined data types-Data Abstraction-Exception Handling- Concurrency Mechanism – Seven Steps of implementing software – Implementation Challenges and its resolution.		
Module:5	SOFTWARE TESTING	4 hours
TESTING: Introduction; Software Testing Fundamental; Testing Principles; Testing Levels; Verification and Validation: Validation Testing, Validation Test Criteria; Test Plan: Test Documentation; Test Strategies: Top-Down Testing, Bottom-Up Testing, Thread testing, Stress testing, Back-to-back testing; Testing methods and tools: Testing through reviews, Black-box testing (Functional testing), White box testing (glass-box testing), Testing software changes; Additional requirements in testing OO Systems; Metrics Collection, Computation, and Evaluation; Test and QA plan; Managing Testing Functions.		
Module:6	SOFTWARE MAINTENANCE	3 hours
Software Maintenance, Types of Maintenance, Structured versus unstructured maintenance – Maintenance costs – Typical problems with maintenance and its side-effects – Maintenance		

process - Software Configuration Management – Component Reusability - Overview of RE-engineering & Reverse Engineering- Business Process Reengineering- Restructuring- Forward Engineering- Economics of Reengineering.		
Module:7	PROJECT PLANNING AND RISK MANAGEMENT	2 hours
Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Monitoring – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical patterns – Cost schedules.		
Module:8	RECENT TRENDS	2 hours
Total Hours		30 Hrs
Lab Experiments		
1. Work Break-down Structure (Process Based, Product Based, Geographic Based and Role Based) 2. Estimations – Cost & Schedule 3. Entity Relationship Diagram, Context flow diagram, DFD (Structural Modeling and Functional Modeling) 4. State Transition Diagrams (Behavioral Modeling) 5. System Requirements Specification 6. UML diagrams for OO Design 7. Tools for Version Control 8. Black-box, White-box testing Non-functional testing		30 Hrs
Text Book(s)		
1.	Roger Pressman and Bruce Maxim, Software Engineering: A Practitioner's Approach, 9th Edition, McGraw-Hill, 2020.	
Reference Books		
1.	Ian Sommerville, Software Engineering, 10 th Edition, Addison-Wesley, 2015	
2.	Pankaj Jalote, An Integrated Approach to Software Engineering (Texts in Computer Science),Reprint Springer, 2010	
3.	William E. Lewis , “Software Testing and Continuous Quality Improvement”, Third Edition, Auerbach Publications, 2008	
4.	David Gustafson , Schaum's Outline of Software Engineering,1st Edition, 2020	
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar/Lab		

Recommended by Board of Studies	11-02-2021		
Approved by Academic Council	No. 61	Date	18-02-2021